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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,476	12/04/2003	Alexander A. Maltsev	884.A53US1	9533

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EXAMINER	
BAYARD, EMMANUEL	
ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/728,476	MALTSEV ET AL.	
	Examiner	Art Unit	
	Emmanuel Bayard	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25 and 27-30* is/are rejected.

7)☒ Claim(s) *26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

The abstract of the disclosure is objected to because the language should be clear and concise and should not repeat information given in the title. In addition delete all languages after "subchannels." Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 28-30 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

Both types of "descriptive material" are nonstatutory when claimed as descriptive material per se. Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material

is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored in a computer-readable medium, in a computer, on an electromagnetic carrier signal does not make it statutory. See Diehr, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in Benson were unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer."). Such a result would exalt form over substance. In re Sarkar, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) ("[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under § 101, the claimed invention, as a whole, must be evaluated for what it is.") (quoted with approval in Abele; 684 F.2d at 907, 214 USPQ at 687). See also In re Johnson, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting"). Thus, nonstatutory music is not a computer component and it does not

become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 5-10, 14-15, 18, 25, 28 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Kadous et al U.S. Patent No 6,654,408 B1.

As per claims 1, 14, 25 and 28 are Kadous teaches method comprising detecting a plurality of subchannels comprising symbol-modulated orthogonal subcarriers to generate a channelization vector indicating which of the subchannels are active and which of the subchannels are inactive (see col.3, lines 45-55 and col.5, lines 22-50 and col.8, lines 30-67); and performing data-symbol processing on the active subchannels in response to the channelization vector to generate a bit stream from combined contributions of the active subchannels (see fig.9 and col.10, lines 23-25 and col.13, lines 58-60).

As per claim 2, Kadous teaches generating a decoded bit stream from combined contributions of the active subchannels (see abstract and col.3, lines 7-8).

As per claims 5, 15 Kadous teaches comprising refraining from performing data-symbol processing on the inactive of the subchannels in response to the channelization vector (see col.3, lines 45-60).

As per claim 6, Kadous inherently teaches providing the channelization vector to data-symbol processing circuitry, wherein the data-symbol processing circuitry is responsive to the channelization vector to perform data-symbol processing on the active subchannels, and wherein the data-symbol processing circuitry is responsive to the channelization vector to turn-off data-symbol processing on the inactive subchannels (see col.3, lines 45-60 and col.5, lies 20-55).

As per claims 7 and 30, Kadous inherently teaches wherein the performing data-symbol processing comprises performing a DFT is the same as the claimed (fast-Fourier transform) (see col.8, lines 5-15 and col.9, lines 36-40)) on only the active subchannels to generate a bit stream from combined contributions of the active subchannels.

As per claim 8, Kadous teaches providing the channelization vector to combiner circuitry; and combining, with the combiner circuitry, bit streams from the data-symbol processing of the active subchannels to generate a combined bit stream (see fig.9 element 57, 52).

As per claim 9, Kadous inherently teaches refraining from combining a processing output generated from the inactive subchannels.

As per claim 10, Kadous inherently teaches generating a channelization vector for a plurality of received packets; and repeating the detecting and performing the data-symbol processing for the received packets, wherein the received packets comprise symbols modulated on a plurality of orthogonal subcarriers of an orthogonal frequency-division multiplexed signal (see abstract and col.1, lines 40-50 and col.17, lines 49-55).

As per claim 18, Kadous inherently teaches wherein the data-symbol processing circuitry comprises a combiner to generate a combined bit stream from individual bit streams generated by data-symbol processing the active subchannels in response to channelization vector (see fig.9 element 57, 52), the combiner to refrain from combining contributions from the inactive subchannels in response to the channelization vector.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 3-4, 16 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadous et al U.S. Patent No 6,654,408 B1 in view of Song et al U.S. Pub No 2004/0202138 A1.

As per claims 3, 16 and 29 Kadous et al teaches all the features of the claimed invention except wherein detecting comprises independently detecting the subchannels of the plurality with a parallel set of matched filters.

Song et al teaches detecting the subchannels of the plurality with a parallel set of matched filters (see fig.2 elements 9—92 and page 3 [0067]).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Song et al into Kadous as to perform chip matched on each received signals in order to accurately reduce fading in the channel as taught by Song (see page 3 [0060-0067]).

As per claim 4, Song et al teaches wherein detecting comprises detecting the subchannels with a parallel set of matched filters, wherein each of the matched filters has a coefficient spectrum matched to a corresponding one of the subchannels (see fig.2 elements 9—92 and page 3 [0067]). Furthermore implementing such teaching into Kadous would have been obvious to one skilled in the art as to perform chip matched on each received signals in order to accurately reduce fading in the channel as taught by Song (see page 3 [0060-0067]).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadous et al U.S. Patent No 6,654,408 B1 in view Thomson et al U.S. Pub No 2003/0058951 A1.

As per claim 11, Kadous teaches all the features of the claimed invention except receiving a synchronized sequence of short-training symbols on at least two of the active subchannels, the sequence of short-training symbols comprising at least a portion of preamble of a received packet, wherein the detecting comprises sampling the sequence of short-training symbols on the at least two active subchannels, and wherein the data-symbol processing comprises data-symbol processing a sequence of long-training symbols and data symbols on the active subchannels, the long-training symbols and data symbols following the sequence of short-training symbols in the packet.

Thomson et al teaches receiving a synchronized sequence of short-training symbols on at least two of the active subchannels, the sequence of short-training symbols comprising at least a portion of preamble of a received packet, wherein the detecting comprises sampling the sequence of short-training symbols on the at least two active subchannels (see page 1 [0011]), and wherein the data-symbol processing comprises data-symbol processing a sequence of long-training symbols and data symbols on the active subchannels, the long-training symbols and data symbols following the sequence of short-training symbols in the packet (see page 5 [0049]).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Thomson into Kadous as to compensate for the mismatch between the transmitter and the receiver as taught by Thomson (see page 5 [0049])

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadous et al U.S. Patent No 6,654,408 B1 in view of Stuber et al U.S. Pub No 2003/0076777 A1.

As per claim 12, Kadous et al teaches all the features of the claimed invention except synchronized data streams on the active subchannels, the synchronized data streams being preceded by a preamble, the channelization vector being generated from detection of the preamble.

Stuber teaches synchronized data streams on the active subchannels, the synchronized data streams being preceded by a preamble, the channelization vector being generated from detection of the preamble (see page 1 [0006].

It would have been obvious to one of ordinary skill in the art to implement the teaching of Stuber into Kadous as to provide increased strength in the recovered signal (see page 1 [0006]).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 13, 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadous et al U.S. Patent No 6,654,408 B1 in view of Walton et al U.S. Pub No 2006/0274844 A1.

As per claim 13, Kadous teaches determining channel conditions of the subchannels, the channel conditions including at least one of an interference level and fading (see abstract and col.2, lines 45-65).

However kadous does not teach sending a request to a transmitter to refrain from transmitting on a subchannel that has poor channel conditions.

Walton et al teaches sending a request to a transmitter to refrain from transmitting on a subchannel that has poor channel conditions (see fig.1 element 140 and page 1 [0009]and page 10 [0107]).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Walton et al into Kadous as to adjust the data rate, the coding scheme and the modulation scheme for data sent to the receiver as taught by Walton (see page 10 [0107]).

As per claim 19, Walton teaches the data-symbol processing circuitry comprises fast-Fourier transform (FFT) circuitry (see page 12 [0125]) for a predetermined number of the subchannels, channel equalization circuitry (see page 2 [0015), demapping circuitry (see fig.5 element 512) and deinterleaving circuitry (see fig.5 element 514) to perform data-symbol processing in parallel for the predetermined number of the

subchannels. Furthermore implementing such teaching into Kadous would have been obvious to one skilled in the art as to accurate recover all the data streams as taught by Walton (see page 8 [0080]).

As per claim 20, Kadous teaches wherein the data-symbol processing circuitry further comprises: a combiner to a combiner to generate a combined bit stream from individual bit streams generated by data-symbol processing the active subchannels in response to channelization vector (see fig.9 element 57, 52); and a decoder to decode the combined bit stream and generate a decoded bit stream output (see abstract).

As per claim 21, Kadous and Walton in combination would teach wherein the data-symbol processing circuitry comprises four 64-bit fast-Fourier transform (FFT) processing circuits to process four 20 MHz subchannels substantially in parallel as to accurate recover all the data streams.

As per claim 22, Kadous and Walton in combination would teach wherein the data-symbol processing circuitry comprises wideband fast-Fourier transform (FFT) circuitry to selectively perform an FFT on parallel groups of time-domain samples from the active subchannels in response to the channelization vector and to selectively refrain from performing the FFT on the parallel groups of time-domain samples from the inactive subchannels in further response to the channelization vector parallel as to accurate recover all the data streams.

As per claim 23, Kadous and Walton in combination would teach wherein the wideband fast-Fourier transform (FFT) circuitry comprises a 256-bit FFT processing

circuit to process 256 parallel symbols from a wideband channel comprised of up to four 20 MHz subchannels parallel as to accurate recover all the data streams

As per claim 24, Kadous and Walton in combination would teach a wideband decoder to generate a decoded bit stream from combined bit streams from the active subchannels parallel as to accurate recover all the data streams.

Allowable Subject Matter

11. Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ling et al U.S. Pub 2005/0002336 teaches method and apparatus for utilizing channel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM) Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571 272 2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Emmanuel Bayard
Primary Examiner
Art Unit 2611

2/26/07

EMMANUEL BAYARD
PRIMARY EXAMINER